This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners’ meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.
1 A Desktop computer [1]
B Inkjet printer [1]
C Optical disc [1]
D Trackerball [1]

2 Two from:
   Motor
   Light
   Heater
   Monitor
   Printer
   Graph plotter
   LED display
   LCD display
   Buzzer [2]

3 Two from:
   Faster data access times
   Faster data transfer rate
   Stores more data [2]

4

<table>
<thead>
<tr>
<th></th>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMR is used to read data from multi choice question papers.</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>OCR is used to read data from word processed documents.</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>DTP is used to create financial models.</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Regular use of computers improves your eyesight.</td>
<td></td>
<td>✔</td>
</tr>
</tbody>
</table>
5

Fewer books can be borrowed.
Libraries can stay open longer.
More information is more easily available to borrowers. [1]
More people work at the library.
Nobody borrows books any more.
The librarian is automatically notified when books are late. [1]

6

PENDOWN RIGHT 90* PENUP
LEFT 90 PENUM* FORWARD 15
FORWARD 15 FORWARD 15 RIGHT 90 *
RIGHT 90 PENDOWN PENDOWN*  
FORWARD 65 FORWARD 50 FORWARD 65

*Denotes interchangeable statements

1 mark for every pair of instructions [6]

7 (a) =SUM(B3:D3) or =B3+C3+D3 [1]

(b) =MAX(B3:B6) [1]

8 (a) Two from:
- Temperature sensor
- Number pad
- Remote control
- Touch screen [2]

(b) Three from:
- Microprocessor stores required temperature as preset value
- Microprocessor receives temperature from sensor
- Microprocessor compares temperature from sensor to pre-set temperature
  If temperature is lower than preset value microprocessor sends a signal to the actuator…
    …. to turn heater on
  If higher than preset value microprocessor sends a signal to turn heater off [3]
9 (a) (i) Alphanumeric/text [1] 
   (ii) Boolean/logical [1] 
   (iii) Numeric/integer [1] 

(b) Format/picture/length [1] 

10 (a) Three from: 
   Humidity 
   Temperature 
   Pressure 
   (Sun)light 
   Rainfall [3] 

(b) (i) Sensor measures analogue data 
      Computer works in digital [1] 

   (ii) Analogue to digital converter [1] 

(c) Three from: 
   Computer can take readings during holidays 
   Computer (readings) are more accurate 
   Students might forget to take readings/readings can be taken at regular intervals 
   Readings can be taken more frequently 
   Readings can be taken any time of day or night 
   Can produce graphs more quickly/automatically [3] 

11 1. Collect information about the existing system. 
2. Design a file structure. 
3. Develop the new system. 
4. Implement the new system. 
5. Evaluate the new system. 

5 in correct order = 5 
Any 4 in the right order = 4 marks 
Any 3 in the right order or position = 3 marks 
Any 2 in the right order or position = 2 marks 
Collect information… first (the rest wrong) or Evaluate the system last (the rest wrong) = 1 
Just having one item in correct position (except collect or evaluate) = 0 [5]
12 (a) 

- Text ✓
- Integers
- Sound ✓ [1]
- Decimal numbers
- Video ✓ [1]
- Graphics

(b) **Two** from:
- Microphone
- Sound card
- Speakers [2]

(c) **Two** matched pairs from:
- Desk Top Publishing
  Producing the layout/template of the brochure
- Database
  List of characters/actors
- Spreadsheet
  Prices/list of refreshments and costs
- Word processing
  Type/enter/create/produce the text for the brochure/don’t allow write (up) the information
- Image editing software/graphics package
  To prepare images for inclusion in brochure [4]

13 (a) **Two** from:
- Switched hub
  Has many computers connected to it
  Can learn/store addresses of each computer in that part of the network
  Can direct data to specific computers/devices [2]
14  (a) Three from:
Hackers may read the data and pass it on/find out embarrassing details and pass it on
Hackers may delete the data/remove accounts
Hackers may amend the data/change how much money they have in their account
Hackers may create new accounts to defraud the bank
Transfer money from customer’s accounts to hacker’s own account  [3]

(b) Three from:
Usernames identify the customer to the system/Passwords – customers can’t access the system if they don’t know the password/unauthorised users will not know the password/memorable data – only people who know the memorable data will be able to access the account

Biometric methods are used because they are unique to each customer so only customer with specific biometric features can access that account

TAN – only customers with the phone that the TAN has been sent to and know the password can access the account

Two factor authentication – only people with device, card and PIN can access the account

Magnetic stripe/smart card/Dongle/card with chip – prevents people without cards/readers/dongle accessing system  [3]

15  (a) Two from:
Fewer printers are needed
Fewer scanners are needed
Can access work from any computer
Data can be shared between computers/data can be accessed by one computer from another more easily
Software can be shared/updated more easily
All computers can access the internet /through one connection  [2]

(b) Three from:
Greater risk of hackers
Greater risk of viruses
The significant cost of extra equipment
When the network is down, cannot use network computers/can still use standalones
Print queues can be long  [3]
(c) **Six from:**

**Advantages**
- Laptops can be transported from room to room more easily
- Safer – won’t trip over loose cables
- Can use laptops outside the classroom if required
- Can be used even if there’s a power cut

**Disadvantages**
- Laptops may be more expensive than network PCs.
- Display is smaller
- Laptops will need recharging periodically
- Have to be in range of a network point

One mark available for reasoned conclusion
Must have at least one advantage and disadvantage to gain full marks [6]

16 **Six from:**

**Advantages**
- Less danger of mugging
- Don’t have to waste time travelling/queuing
- Don’t have to spend money on travelling to shops
- Greater choice of goods
- Can shop when shops are closed
- Easier to search and find what you are looking for
- Comparison websites will find you the cheapest option
- Goods may be cheaper as shops have less staff to pay/less premises to rent
- Don’t have to pay car parking charges
- Don’t have to pay for shopping bags
- Vouchers/special deals are often only available online/online discounts

**Disadvantages**
- Lack of socialising/social contacts
- Hackers may intercept data and defraud customer
- Deprived of personal touch
- Cannot see/feel goods in reality
- More vulnerable to phishing/pharming
- Goods sometimes don’t arrive/substitute goods may be sent/take longer to arrive/may be delivered to wrong address
- Shipping charges
- ISP costs/Possible high connection charges
- Initial cost of equipment/phone line
- Postal costs of returning items

One mark available for reasoned conclusion
Must have at least one advantage and disadvantage to gain full marks [6]
17 (a) Five from:
- Current system is observed:
- Mechanics/potential users interviewed
- Mechanics/potential users given questionnaires
- Gather information from manufacturers/about current system/from experts
- Existing documents examined
- Inputs, outputs and processing of the current system determined
- Problems with current system identified
- User and information requirements identified
- System specification decided
- Knowledge base designed
- Inference engine designed
- Rules base designed
- User interface designed
- Hardware chosen

(b) Two from:
- Medical diagnosis
- Mineral prospecting
- Tax
- Careers
- Chess games
- Animal/plant classification/identification
- Computer fault diagnosis

18 Two problems from:
- Headaches
- Eyestrain
- Backache

Two matching methods from:
- Use anti-glare screen (headaches/eyestrain)
- Take regular breaks (all)
- Use straight backed chair/ergonomic/maintain good posture (backache)

19 (a) Three from:
- Normal data
- Abnormal data
- Extreme data
- Live data

(b) Benefit – cheaper as only one set of workers needed
Drawback – have no backup system to fall back on
(c) **Four** descriptions from:
- Pharmacist can save queries about details of medicines
- Pharmacist can create reports of stock
- Pharmacist can create charts of sales
- Pharmacist can sort medicine records
- Pharmacist can enter data using Input forms
- Pharmacist can derive costs of re-ordering medicines using calculated fields

Description of how two tables could be linked by the pharmacist [4]